National Institute of Environmental Health Sciences

Climate variability and the outbreaks of cholera in Zanzibar, East Africa: A time series analysis

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Abstract:

Global cholera incidence is increasing, particularly in sub-Saharan Africa. We examined the impact of climate and ocean environmental variability on cholera outbreaks, and developed a forecasting model for outbreaks in Zanzibar. Routine cholera surveillance reports between 1997 and 2006 were correlated with remotely and locally sensed environmental data. A seasonal autoregressive integrated moving average (SARIMA) model determined the impact of climate and environmental variability on cholera. The SARIMA model shows temporal clustering of cholera. A 1 degrees C increase in temperature at 4 months lag resulted in a 2-fold increase of cholera cases, and an increase of 200 mm of rainfall at 2 months lag resulted in a 1.6-fold increase of cholera cases. Temperature and rainfall interaction yielded a significantly positive association ($P < 0.04$) with cholera at a 1-month lag. These results may be applied to forecast cholera outbreaks, and guide public health resources in controlling cholera in Zanzibar.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3110353

Resource Description

Early Warning System: ☑

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☑

weather or climate related pathway by which climate change affects health

Precipitation, Temperature

Geographic Feature: ☑

resource focuses on specific type of geography

Ocean/Coastal

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Africa

African Region/Country: African Country

Other African Country: Tanzania

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Foodborne/Waterborne Disease

Foodborne/Waterborne Disease: Cholera

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Population of Concern: A focus of content

Population of Concern: ☑

populations at particular risk or vulnerability to climate change impacts

Low Socioeconomic Status

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content